

History of Science 337, Fall 1999
History of Technology: A Thousand-Year Survey
9:30-10:45 TuTh, 4308 Social Science

Professor:	Eric Schatzberg	Office Hrs:	2-3 Tuesday or by appt.
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Description:

This course surveys the history of Western technology from the Gothic cathedral to the Internet, roughly 1000 AD to the present. The course makes no attempt at comprehensive coverage, but rather presents technology as an integral part of human history, both shaped by and shaping society. Major topics include the technological roots of Western hegemony, the causes and consequences of the Industrial Revolution, the rise of the United States as a technological power, and the close connection between the military and technology in the Cold War.

Requirements:

Reading responses. There will be four one-page readings responses during the semester, usually in conjunction with discussion. I will send out instructions by email. The responses are due on 9/9, 10/14, 11/4, 12/9.

Take-home essays. There will be four short take-home essay exams during the semester, with a take-home final at the end of the semester. Essays are due 9/30, 10/26, 11/18, and 12/20 (final).

Discussion. Roughly every second Thursday is devoted to formal discussions. Your discussion grade will be based on attendance and participation.

A note about writing. Writing is not just for English courses. I grade papers on quality of prose as well as content.

Email Class List:

I have set up an email list for this course at "histsci-337@lists.students.wisc.edu"; anything mailed to the list will be distributed to everyone registered for the class. I will use the class list to distribute questions for the reading responses and essays. Students should feel free to contribute to the list, for example, by commenting on the readings or raising questions regarding lectures.

Grades

Take-home essays, 60%; reading responses, 20%; discussion, 20%.

Course Books:

The following books are available at Canterbury Booksellers, 315 W. Gorham Street, 258-9911.

Carlo M. Cipolla, *Guns, Sails, and Empires: Technological Innovation and the Early Phases of European Expansion, 1400-1700* (Manhattan, Kan.: Sunflower University Press, c1965);

Patrick M. Malone, *The Skulking Way of War: Technology and Tactics Among the New England Indians* (Baltimore: Johns Hopkins University Press, 1991);

Thomas P. Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm* (New York: Viking Penguin, 1989);

Loren R. Graham, *Ghost of the Executed Engineer: Technology and the Fall of the Soviet Union* (Cambridge: Harvard University Press, 1993).

A course packet for the other required readings is available for purchase from the History of Science department office, 7143 Social Science (262-1406). The price is \$11.00. All readings are also on reserve at College Library.

Course Outline

Week 1 (9/2): Introduction – What is Technology?

Overview of the course; defining technology.

Week 2 (9/7, 9/9): Symbolic Technologies of the Middle Ages

Symbolic versus utilitarian technologies--the gothic cathedral. Discussion: the politics of technology.

Reading: Langdon Winner, "Do Artifacts Have Politics?" 19-39;
Arnold Pacey, "The Cathedral Builders," 1-28.

Video: "The Cathedral Builders."

Assignment: one-page reading response on Winner due Thursday; come prepared for discussion.

Week 3 (9/14, 9/16): Western Expansion, 1

Printing, mechanical clocks, and gunpowder weapons; the technological basis for Western imperialism.

Reading: Carlo M. Cipolla, *Guns, Sails, and Empires*, 15-89.

Week 4 (9/21, 9/23): Western Expansion, 2

Europe becomes a global power. Discussion Thursday.

Reading: Cipolla, 90-148; Malone, *The Skulking Way of War*, 8-32.

Week 5 (9/28, 9/30): Western Expansion, 3

Encounters with the "new" world; the technological basis of the Atlantic economy.

Reading: Malone, 33-128.

Assignment: First essay due 9/30; discussion on Thursday.

Week 6 (10/5, 10/7): Industrial Revolution - Economics and Technology

Nature of industrialization; key technological changes in textiles, iron and steam power.

Reading: E. J. Hobsbawm, *Industry and Empire*, 40-60 (note that we read chapter 3 this week and chapter 2 next);
Joel Mokyr, "The Years of Miracles," 81-112.

Week 7 (10/12, 10/14): Industrial Revolution – Causes

Science, Atlantic trade, and slavery.

Reading: E. J. Hobsbawm, *Industry and Empire*, 20-39;
Richard Olson, "Science, Technology and the Industrial Revolution," 316-44;
Ronald Bailey, "The Other Side of Slavery," 35-50.

Assignment: One-page reading response due 10/14.

Week 8 (10/19, 10/21): Industrial Revolution - Social Impact

Workers and the factory system.

Reading: J. L. Hammond and Barbara Hammond, "The Shadow of the Slave Trade," 190-209;
Andrew Ure, *The Philosophy of Manufactures* (1835), 298-313;
Friedrich Engels, *The Condition of the Working Class in England* (1845), 144-178.

Supplemental: E. P. Thompson, *The Making of the English Working Class*, 553-602.

Video: "The Luddites."

Assignment: Second short essay due, 10/26 (Tuesday of next week).

Week 9 (10/26, 10/28): American Inventiveness and the Second Industrial Revolution

Technology in the late-nineteenth century: the age of heroic inventors and the rise of the industrial corporation.

Reading: Thomas P. Hughes, *American Genesis*, 1-95.

Week 10 (11/2, 11/4): Source of Innovation: Military and Big Business

The rise of the industrial research laboratory; military origins of mass production.

Reading: Hughes, *American Genesis*, 96-184.

Assignment: reading response due 11/4.

Week 11 (11/9, 11/11): The Spirit of System: Mass Production and Electric Power

Controlling workers; the assembly line; big technological systems.

Reading: Hughes, *American Genesis*, 184-248;
Stephen Meyer, "The Evolution of the New Industrial Technology," 9-36.

Week 12 (11/16, 11/18): Technology, Ideology and the State

Technology under Stalinism.

Reading: Loren Graham, *Ghost of the Executed Engineer*, 1-106.

Recommended reading: Hughes, *American Genesis*, 249-94.

Assignment: Third short essay due 11/18; be prepared for discussion.

Week 13 (11/23): Technology and Aesthetic Modernism

Technology as inspiration for art and architecture between the World Wars.

Reading: Hughes, *American Genesis*, 295-352;
Le Corbusier, *Towards a New Architecture*, 9-31.

Thanksgiving Recess (11/25)

Week 14 (11/30, 12/2): The Manhattan Project and the Postwar Order

Origins of the military-university-industry-science-technology complex.

Reading: Hughes, *American Genesis*, 353-442.

Week 15 (12/7, 12/9): Technology and the Counterculture

The critique of technology in the 1960s and beyond: the consumer movement, environmentalism, and the counterculture.

Reading: Hughes, *American Genesis*, 443-472;
Herbert Marcuse, "Introduction," *One-Dimensional Man*, ix-xvii;
Barry Commoner, "Technology and the Natural Environment," 69-73;
Ralph Nader, "The Safe Car You Can't Buy," 310-13. and "Fashion or Safety," 214-16.

Assignment: Reading response due 12/9; be prepared for discussion.

Week 16 (12/14): Technology and the Future?

Hype and hope for digital age.

Reading: Langdon Winner, "Mythinformation," in *The Whale and the Reactor*, 98-117;
Esther Dyson, George Gilder, George Keyworth and Alvin Toffler, "Cyberspace and the American Dream: A Magna Carta for the Knowledge Age," Release 1.2, August 22, 1994;
David Noble, "The Truth About the Information Highway," Feb. 15, 1995.

Final Essay Due, Monday, 12/20, 10:00 am.

Photocopied Readings

1. Langdon Winner, "Do Artifacts Have Politics?" in *The Whale and the Reactor* (Chicago: University of Chicago Press, 1986), 19-39.
4. Arnold Pacey, "The Cathedral Builders," in *The Maze of Ingenuity: Ideas and Idealism in the Development of Technology*, 2nd ed. (Cambridge: MIT Press, 1992), 1-28.
6. E. J. Hobsbawm, "The Origin of the Industrial Revolution," and "The Industrial Revolution, 1780-1840," in *Industry and Empire* (London: Weidenfeld & Nicolson, 1968), 23-78.
7. Joel Mokyr, "The Years of Miracles," in *The Lever of Riches: Technological Creativity and Economic Progress* (Oxford: Oxford University Press, 1990), 81-112.
8. A. R. Hall, "What did the Industrial Revolution Owe to Science?" in *Historical Perspectives: Studies in English Thought and Society in Honour of J. H. Plumb*, ed. Neil McKendrick (London: Europa, 1974), 129-51.
9. Richard Olson, "Science, Technology and the Industrial Revolution," in *Science Deified & Science Defied*, vol. 2 (Berkeley: University of California Press, 1990), 316-44.
10. Ronald Bailey, "The Other Side of Slavery: Black Labor, Cotton, and Textile Industrialization in Great Britain and the United States," *Agricultural History* 68 (Spring 1994): 35-50.
10. J. L. Hammond and Barbara Hammond, "The Shadow of the Slave Trade," in *The Rise of Modern Industry*, 9th ed. (London: Methuen, 1966), 190-209.
11. Andrew Ure, "Moral Economy of the Factory System," in *The Philosophy of Manufactures, or an Exposition of the Scientific, Moral, and Commercial Economy of the Factory System of Great Britain* (London: Charles Knight, 1835; repr. 1967), 298-313.
12. Friedrich Engels, *The Condition of the Working Class in England* (Oxford: Oxford University Press, 1993; orig. 1845), 144-178.
13. E. P. Thompson, *The Making of the English Working Class* (New York: Pantheon, 1963), 553-602.
14. Stephen Meyer, "The Evolution of the New Industrial Technology," in *The Five Dollar Day: Labor Management and Social Control in the Ford Motor Company, 1908-1921* (Albany: State University of New York Press, 1981), 9-36.
15. Le Corbusier, *Towards a New Architecture* (New York, Brewer & Warren 1927), 9-31.

16. Herbert Marcuse, "Introduction: The Paralysis of Criticism: Society Without Opposition," in *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society* (Boston: Beacon Press, 1964), ix-xvii.
17. Barry Commoner, "Technology and the Natural Environment," *The Architectural Forum* 130 (June 1969), 69-73.
18. Ralph Nader, "The Safe Car You Can't Buy," *The Nation* 188 (April 11, 1959), 310-13 and "Fashion or Safety," *The Nation* 197 (Oct. 12, 1963), 214-16..
19. Langdon Winner, "Mythinformation," in *The Whale and the Reactor* (Chicago: University of Chicago Press, 1986), 98-117.
20. Esther Dyson, George Gilder, George Keyworth and Alvin Toffler, "Cyberspace and the American Dream: A Magna Carta for the Knowledge Age," Release 1.2, August 22, 1994, available at <http://www.townhall.com:80/pff/position.html>, modified July 11, 1996.
21. David Noble, "The Truth About the Information Highway," *CPU: Working in the Computer Industry* no. 13 (Feb. 15, 1995), <http://www.cpsr.org/program/workplace/cpu.013.html#Feature1>.